



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/580,582

04/23/2007

Mark A. Greaney

P2003J098

5545

27810

7590

02/05/2009

ExxonMobil Research & Engineering Company

P.O. Box 900

1545 Route 22 East

Annandale, NJ 08801-0900

EXAMINER

ROBINSON, RENEE E

ART UNIT

PAPER NUMBER

1797

MAIL DATE

DELIVERY MODE

02/05/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/580,582	Applicant(s) GREANEY ET AL.	
	Examiner RENEE ROBINSON	Art Unit 4132	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 May 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 3, 8, 9 and 12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

3. Regarding claim 3, it is unclear what is meant by the limitation "lube oil boiling range feedstream contains about 50% wax" in lines 2-3. It is unclear whether the claimed wax content is a percentage by weight or whether some other percentage is claimed.

4. Regarding claim 8, it is unclear what is meant by the phrase "any means known". It is unclear whether the claim scope would be the same were it not to be present or whether it has some other meaning, including perhaps an invocation of "means or step plus function" claim language, as provided for by 35 USC § 112, sixth paragraph. If the latter, "means for" language is suggested. Moreover, if so, it is unclear whether clear linkage to disclosed means has been provided in the Specification.

Double Patenting

5. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent

Art Unit: 4132

and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

6. A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

7. Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

8. Claims 1, 2, and 4-12 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-9, 13-15, 18-20, 23-29, 33, 35 and 38 of copending Application No. 10/579,176 in view of Mills et al (U.S. Patent 3,681,233).

Art Unit: 4132

9. Regarding claim 1 of the instant application and claims 1, 6, 13, 14, 24 and 39 of the copending application, both claim a hydrotreating/hydroprocessing of a hydrocarbon feedstream containing nitrogen contaminants, comprising:

- a) providing a sulfuric acid solution having a sulfuric acid concentration of at least about 75%, based on the sulfuric acid solution;
- b) contacting the feedstream with the sulfuric acid solution under conditions effective at removing at least 60 wt.% (or greater than 75 wt.%) of the nitrogen compounds contained in the feedstream, wherein the volumetric treat rate of the sulfuric acid solution is greater than about 0.5 vol.%, based on the feedstream; and
- c) processing the effluent by a hydrotreating process.

10. The differences between the instant application and the copending application are:

- The copending application claims a hydrotreating method for diesel boiling range feedstream, while the instant application claims a lube oil boiling range feedstream.
- The copending application claims removing at least 85 wt.% of the nitrogen in the feedstream, whereas the instant application claims removing at least 60 wt.%. However, removal of 85 wt.% of the copending application satisfies the limitation of at least 60 wt.% claimed in the instant application.

Art Unit: 4132

11. Mills discloses a method for the hydroprocessing of nitrogen-containing lube oil boiling range ($>600^{\circ}\text{F}$ or 315°C) feedstream (column 4, lines 35-43; column 5, lines 69-71). The process comprises contacting a nitrogen-containing lube oil boiling range feedstream with a sulfuric acid solution having a concentration greater than 75% (93-120%) under conditions which remove at least 60 wt.% of the nitrogen compounds contained in the feedstream (column 6, lines 37-38; column 8, lines 57-60).

12. Therefore, a person of ordinary skill in the art would have been motivated to modify the process as claimed in the copending application to hydroprocess feedstreams with boiling points outside of the diesel boiling range, as suggested by Mills.

13. One having ordinary skill in the art would have been motivated to do this in order to effectively remove nitrogen from feedstreams with boiling points outside of the diesel boiling range.

14. Regarding claim 4 of the instant application and claims 4 and 25 of the copending application, both claim a nitrogen content in the feedstream of greater than 100 wpppm.

15. Regarding claim 2 of the instant application and claims 2, 3 of the copending application, the instant application claims an initial boiling point of about 315°C (600°F), whereas the copending application claims a boiling point in the range of $300\text{-}775^{\circ}\text{F}$ (claim 2) and $400\text{-}700^{\circ}\text{F}$ (claim 3). However, this limitation is addressed in the double patenting rejection of claim 1 of the instant application above. One having ordinary skill in the art would have been motivated by Mills to hydroprocess a hydrocarbon

Art Unit: 4132

feedstream with a boiling point above 700°F because Mills teaches that it is an effective way to remove nitrogen contaminants from the feedstream.

16. Regarding claim 5 of the instant application and claims 5 and 26 of the copending application, the instant application claims that the nitrogen in the feedstock is basic and non-basic heterocyclic nitrogen compounds, whereas the copending application claims carbazole and/or substitutes carbazoles. However, carbazole is a type of heterocyclic nitrogen compound.

17. Claims 6 and 10 of the instant application and claims 7, 8, 28 and 39 of the copending application are identical except with regards to the differences in the independent claims, as discussed above.

18. Claim 7 of the instant application and claim 15 of the copending application are identical except with regards to the differences in the independent claims, as discussed above.

19. Claim 8 of the instant application and claims 18-19 and 35 all pertain to separating the sulfuric acid solution from the effluent. Claim 8 of the instant application differs from claims 18 and 35 of the copending application in that the copending application does not claim separating “by any means known to be effective”. However, it is implicit in a claim to separating the sulfuric acid solution from the effluent that the means by which it is accomplished is effective. Claim 8 of the instant application and claim 19 of the copending application are identical except with regards to the differences in the independent claims, as discussed above.

Art Unit: 4132

20. Claim 9 of the instant application and claims 20, 36 and 39 of the copending application are identical except with regards to the differences in the independent claims, as discussed above.

21. Regarding claim 10 of the instant application and claims 8 and 39 (steps a) and b)) of the copending application are identical except with regards to the differences in the independent claims, as discussed above.

22. Regarding claim 11 of the instant application and claims 9 and 29 of the copending application, the instant application claims adding a diluent to the sulfuric acid solution to adjust the concentration, whereas the copending application claims adding water to adjust the sulfuric acid concentration. However, water is a type of diluent.

23. Claim 12 of the instant application and claims 23 and 38 of the copending application are identical except with regards to the differences in the independent claims, as discussed above.

24. This is a provisional obviousness-type double patenting rejection.

25. Claims 1, 2 and 4-12 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-3, 5-10, 13-17, 19 and 28 of copending Application No. 10/579,178.

26. Although the conflicting claims are not identical, they are not patentably distinct from each other because both pertain to an improved method for hydroprocessing/hydrotreating of a hydrocarbon feedstream containing nitrogen contaminants.

Art Unit: 4132

27. Regarding claim 1 of the instant application and claim 1, 7, 13, 17 of the copending application, both claim a hydroprocessing of hydrocarbon feedstream containing nitrogen contaminants, comprising:

- a) providing a sulfuric acid solution having a sulfuric acid concentration of at least about 75%, based on the sulfuric acid solution;
- b) contacting the feedstream with the sulfuric acid solution under conditions effective at removing at least 60 wt.% of the nitrogen compounds contained in the feedstream, wherein the volumetric treat rate of the sulfuric acid solution is greater than about 0.5 vol.%, based on the feedstream; and
- c) processing the lube oil effluent by a process selected from hydrotreating, hydrocracking, hydrodewaxing, and hydrofinishing.

28. The difference between the instant application and the copending application is that the copending application claims a broad feedstream of hydrocarbons for the hydroprocessing method, while the instant application claims a lube oil boiling range feedstream. However, the copending application claims lube oil boiling range feedstreams in dependent claims 3 and 28. Therefore, one of ordinary skill in the art would have been motivated to use the process as disclosed in the copending application to hydroprocess lube oil boiling range feedstreams.

29. Regarding claim 2 of the instant application and the copending application, the copending application claims that the hydrocarbon feedstream boils above 300°F, which

Art Unit: 4132

encompasses a lube oil boiling range feedstream having an initial boiling point of about 315°C.

30. Regarding claim 4 of the instant application and claim 5 of the copending application, the instant application claim a nitrogen-containing feedstream containing greater than about 100wppm nitrogen, whereas the copending application claims a nitrogen content of about 25-2500wppm. However, this encompasses the claimed range of greater than 100wppm claimed in the instant application.

31. Regarding claim 5 of the instant application and claim 6 of the copending application, the instant application claims that the nitrogen in the feedstock is basic and non-basic heterocyclic nitrogen compounds, whereas the copending application claims carbazole and/or substitutes carbazoles. However, carbazole is a type of heterocyclic nitrogen compound.

32. Regarding claims 6 and 10 of the instant application and claims 8 and 9 of the copending application, both claim that the sulfuric acid solution is a sulfuric acid solution obtained from an alkylation process unit. Both further claim that the alkylation process comprises:

- a) Combining and olefinic hydrocarbon feedstream containing C₄ olefins with isobutane to form a hydrocarbonaceous mixture; and
- b) Contacting the hydrocarbonaceous mixture with sulfuric acid under conditions effective for producing at least an alkylate and a sulfuric acid solution having an acid concentration of at least about 75 wt.%.

Art Unit: 4132

33. The instant application claims that the sulfuric acid solution obtained from the alkylation process unit is a spent sulfuric acid solution, whereas the copending application does not expressly state that the sulfuric acid solution is spent. However, since the sulfuric acid is obtained from the identical process, Examiner understands the sulfuric acid solution from the alkylation process unit claimed in the copending application to be a spent sulfuric acid solution.

34. Claim 7 of the instant application and claim 14 of the copending application are identical except with regards to the differences in the independent claims, as discussed above.

35. Regarding claim 11 of the instant application and claim 10 of the copending application, the instant application claims adding a diluent to the sulfuric acid solution to adjust the concentration, whereas the copending application claims adding water to adjust the sulfuric acid concentration. However, water is a type of diluent.

36. Claim 8 of the instant application and claim 15 of the copending application, respectively, are identical except with regards to the differences in the independent claims, as discussed above.

37. Claim 9 of the instant application and claim 16 of the copending application, respectively, are identical except with regards to the differences in the independent claims, as discussed above.

38. Regarding claim 12 of the instant application and claim 19 of the copending application, both claim contacting the effluent with an effective amount of an acid

Art Unit: 4132

reducing material selected from caustic and water under conditions effective at reducing the total acid number of the effluent (product).

39. This is a provisional obviousness-type double patenting rejection.

Claim Rejections - 35 USC § 102

40. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

41. Claims 1, 2, 4, 5, 7, 8, and 11-13 are rejected under 35 U.S.C. 102(b) as being anticipated by Mills et al (U.S. Patent 3,681,233).

42. Regarding claim 1, Mills discloses a method for the hydroprocessing of nitrogen-containing lube oil boiling range (> 600°F or 315°C) feedstream (column 4, lines 35-43; column 5, lines 69-71), comprising:

- a) providing a sulfuric acid solution having a sulfuric acid concentration of between 93-120%, which is within Applicant's claimed range (column 6, lines 37-38);
- b) contacting the nitrogen-containing lube oil boiling range feedstream with the sulfuric acid solution under conditions effective at removing at least 60 wt.% of the nitrogen compounds contained in the feedstream, wherein the volumetric treat rate of the sulfuric acid solution is within applicant's claimed range (10-60 lbs/bbl, or approximately 0.7-4 gal/bbl based on a

Art Unit: 4132

100% H₂SO₄ treat) based on the feedstream, thereby producing at least a mixture comprising a lube oil boiling range effluent and a used sulfuric acid solution (column 6, lines 37-38; column 8, lines 57-60); and

- c) processing the lube oil boiling effluent by a hydrotreating (hydrorefining) process (column 3, lines 17-18).

43. Regarding claim 2, Mills discloses that the nitrogen-containing lube oil boiling range feedstream has an initial boiling point of about 315°C (600°F) (column 4, lines 39-43).

44. Regarding claim 4, Mills discloses that the nitrogen-containing lube oil boiling range feedstream contains up to 500 wppm, which encompasses Applicant's claimed nitrogen content of greater than 100 wppm (column 5, lines 69-71).

45. Regarding claim 5, Mills does not expressly disclose that the nitrogen compounds present in the nitrogen-containing lube oil boiling range feedstream are basic and non-basic heterocyclic nitrogen compounds. However, nitrogen compounds which are present in petroleum products (such as lube oil) and have deleterious effects, principally occur as heterocyclic ring compounds, which in turn are generally divided into two classes referred to as acidic and basic nitrogen types, as evidenced by Boggs (U.S. Patent 3,607,732; column 1, lines 6-12). Therefore, since the Mills Patent is concerned with removing nitrogen compounds that have detrimental effects on petroleum products, the nitrogen compounds removed by the disclosed process implicitly includes heterocyclic nitrogen compounds that are basic and non-basic.

Art Unit: 4132

46. Regarding claim 7, Mills discloses that the sulfuric acid solution and lube oil boiling range feedstream are contacted by mixing, which is understood to be a dispersive contacting method (column 6, lines 43-45).

47. Regarding claim 8, Mills discloses that the lube oil boiling range effluent and the used sulfuric acid solution are separated (column 6, lines 50-51).

48. Regarding claim 11, Mills discloses that a diluent is added to the sulfuric acid solution (column 6, lines 43-45). While Mills does not expressly disclose that the diluent adjusts the sulfuric acid concentration in the solution, this is an inherent consequence of adding a diluent to a solution.

49. Regarding claim 12, Mills discloses contacting the lube oil boiling range effluent with an effective amount of caustic under conditions effective at reducing the total acid number of the lube oil boiling range effluent prior to step c) (column 4; lines 5-9; column 6, lines 56-62).

50. Regarding claim 13, Mills discloses that the lube oil boiling range effluent is hydrotreated (hydrorefined) to produce a hydrorefined lube oil boiling range effluent that is subsequently processed by hydrocracking (column 5, lines 14-25).

Claim Rejections - 35 USC § 103

51. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

52. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

53. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

54. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mills et al (U.S. Patent 3,681,233).

55. Mills is relied upon as set forth above in the rejection of claim 1.

56. Regarding claim 3, Mills does not expressly disclose that the nitrogen-containing lube oil boiling range feedstream contains about 50% wax. However, as evidenced by Harrison et al (U.S. Patent 5,306, 419), lubricating oils (lube oils) are derived from waxy petroleum distillate oils, which have a wax content ranging from 5 wt.% to 50 wt.% (column 1, lines 18-19 and 45-46). Therefore, because Mills teaches removing nitrogen

Art Unit: 4132

from lube oils, it would be expected that the feed has a high waxy content. Further, it would have been obvious to a person of ordinary skill in the art to use the process as disclosed by Mills to hydroprocess lube boiling range feeds that have a wax content of about 50% because the process disclosed by Mills demonstrates an effective way to upgrade lube boiling range hydrocarbon feedstocks by reducing the nitrogen content and because lube oils can contain wax contents up to 50%.

57. Claims 6 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mills et al (U.S. Patent 3,681,233) in view of Parvinen et al (U.S. Patent 6,007,722).

58. Mills is relied upon as set forth above in the rejection of claim 1.

59. Regarding claims 6 and 10, Mills does not expressly disclose that the sulfuric acid is a spent sulfuric acid solution obtained from an alkylation process unit and further that the alkylation process comprises:

- a) Combining and olefinic hydrocarbon feedstream containing C₄ olefins with isobutane to form a hydrocarbonaceous mixture; and
- b) Contacting the hydrocarbonaceous mixture with sulfuric acid under conditions effective for producing at least an alkylate and a sulfuric acid solution having an acid concentration of at least about 75 wt.%.

60. Parvinen discloses a process for recycling and reusing spent sulfuric acid obtained from an alkylation process (column 1, lines 60-64; column 2, lines 23-25). The alkylation process comprises:

Art Unit: 4132

- a) Combining an olefinic hydrocarbon feedstream containing C₄ olefins (butene) with isobutane to form a hydrocarbonaceous mixture; and
- b) Contacting the hydrocarbonaceous mixture with sulfuric acid under conditions effective for producing at least an alkylate and a sulfuric acid solution having an acid concentration of at least about 75 wt.% (85-88%) (column 1, lines 57-64; column 2, lines 5-7).

61. Parvinen further discloses that the major drawback of processes using sulfuric acid as a catalyst is the associated costs, with a worldwide use of sulfuric acid in the production of alkylated fuels comprising several million metric tons at the time of the invention (column 2, lines 1-5).

62. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the process as disclosed by Mills by using spent sulfuric acid obtained by an alkylation process, as described by Parvinen.

63. One having ordinary skill in the art would have been motivated to do this in order to reduce product costs by reusing the spent sulfuric acid, thereby decreasing the demand for fresh sulfuric acid in the contacting step of the hydroprocessing process.

64. **Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mills et al (U.S. Patent 3,681,233) in view of Chesluck et al (U.S. Patent 3,953,319).**

65. Mills is relied upon as set forth above in the rejection of claims 1 and 8.

66. Regarding claim 9, Mills discloses separating the lube oil boiling range effluent from the used sulfuric acid, but does not expressly disclose that the separation is

Art Unit: 4132

accomplished by centrifuges, settling tanks or drums, coalescers, electrostatic precipitators, and other similar devices.

67. Chesluck discloses a method for hydroprocessing crude lubricating oil comprising an acid treatment step with sulfuric acid, followed by a separation step to separate the used sulfuric acid from the lubricating oil (column 1, lines 33-36; column 3, lines 1-11). The separation is accomplished in a settling drum (column 3, lines 10-11). Chesluck further discloses that product obtained from the process has good chemical and thermal stability, confirming that the separation by settling was effective in upgrading the lube oil (column 4, lines 10-12).

68. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the process as disclosed by Mills, by separating the used sulfuric acid from the lube oil in a settling tank or drum, as suggested by Chesluck.

69. One having ordinary skill in the art would have been motivated to do this because it is an effective way to separate the sulfuric acid from the lube oil, thereby producing a useful lube oil product with a reduced nitrogen content.

Conclusion

70. Any inquiry concerning this communication or earlier communications from the examiner should be directed to RENEE ROBINSON whose telephone number is (571)270-7371. The examiner can normally be reached on Monday through Thursday 7:30-5:00.

Art Unit: 4132

71. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Lavilla can be reached on (571)272-1539. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

72. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/R. R./
Renee Robinson
Examiner, Art Unit 4132
29 January 2009

**/Michael La Villa/
Michael La Villa
Supervisory Patent Examiner,
Art Unit 4132
2 February 2009**